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REPORT OF PERFORMANCE OF EN 55022 / EN 55024

Applicant's company	Traco Electronic AG TRACO POWER
Applicant Address	Jenatschstrasse 1 CH-8002 Zurich
Manufacturers	
Survey By	Cal-Tech Technology Co.,Ltd.

Product Name	Switching Power Supply for building-in
Brand Name	TRACO POWER
Model Name	TML 20205
Receive Date	Dec 25 2007~Dec. 22, 2010
Test Date	Dec. 27, 2007~Dec. 22, 2010
Submission Type	Original Equipment
Multiple Listing	TML 20105, TML 20112, TML 20115, TML 20124,TML 20103, TML 20107, TML 20109, TML 20212, TML 20215,TML 20512, TML 20515,
Test Standard	EN 61000-6-3:2001/A11:2004 EN 55024:1999/A1:2001/A2:2003 EN 55022:2006 EN 61000-3-2:2006 EN 61000-3-3:1995/A2:2005 EN 61000-4-2:1995/A2:2001 EN 61000-4-3:2006 EN 61000-4-4:2004 EN 61000-4-5:2006 EN 61000-4-6:1996/A1:2001 EN 61000-4-8:1993/A1:2001 EN 61000-4-5:2006

Statement

The testing described in this report has been carried out to the best of our knowledge and ability, and our responsibility is limited to the exercise of reasonable care. This certification is not intended to believe the sellers from their legal and/or contractual obligations

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1. TEST OF COMPLIANCE

Product Name : Switching Power Supply for building-in
Brand Name : **TRACO[®]
POWER**
Model Name : TML 20205
Applicant : Traco Electronic AG
Test Standard : EN 61000-6-3:2001/A11:2004
EN 55024:1999/A1:2001/A2:2003
EN 55022:2006
EN 61000-3-2:2006
EN 61000-3-3:1995/A2:2005

The Switching Power Supply for building-in is tested for Information technology equipment according EN55024 Test Requirements for electromagnetic immunity. EN 61000-6-3 & EN55022 for emission for Information technology equipment.

Test program according EN55022 & EN55024 is performed Information technology equipment model is TML 20205 .The tests were passed.



2010/12/21

Jam Cheng / Checker
Engineering Manager

2. SUMMARY OF THE TEST RESULT

2.1. Test program according to EN55022 & EN55024 & EN 61000-6-3

Item	TEST	EN 55022 & EN 61000-6-3	Result
1	Conducted Emissions	EN 55022	Pass
2	Radiated Emissions	EN 55022	Pass
3	Harmonics Current Emissions	EN 61000-3-2	Pass
4	Voltage Fluctuations and Flicker	EN 61000-3-3	Pass
5	TEST	EN 55024	
6	Electrostatic Discharge Immunity	EN 61000-4-2:1995/A2:2005	Pass
7	RF Radiated Fields Immunity	EN 61000-4-3: 2006	Pass
8	EFT/Burst Immunity	EN 61000-4-4:2004	Pass
9	Surge Immunity	EN 61000-4-5:2006	Pass
10	RF Common Mode Immunity	EN 61000-4-6:1996/A1:2001	Pass
11	Power Frequency Magnetic Field	EN 61000-4-8:1993/A1:2001	Pass
11	Voltage Interruptions and Voltage Dips Immunity	IEC 61000-4-11:2004	Pass

3. HISTORY OF THIS TEST REPORT

Original Report Issue Date: Dec. 28, 2007

☐ No additional attachment.

☒ additional attachment were issued as following record

Attachment No.	Issue Date	Description
RE-V01-CE-96153	2007/12/28	Original CE Test Report
101112003T	2010/12/22	Modification of CE Test Report Changes the Applicant's company.

4. GENERAL INFORMATION

4.1. Test Conditions

Operating Voltage : 230VAC, 50Hz
 Normal Temperature : $+25 \pm 10$ °C
 Relative Humidity : $60\% \pm 30\%$

4.2. Standard for Methods of Measurement

The test program for the TML 20205 is in accordance with the following standards:

Here is the list of the standards followed in this test report.

Within the scope of the test program the following test categories are offered:

- EMC test program includes EN55022 、EN55024 、EN 61000-6-3 、EN 61000-3-2 、EN 61000-3-2

Items	Description
Product Type	Switching Power Supply for building-in
Power Type	TML 20105, TML 20112, TML 20115, TML 20124, TML 20103, TML 20107, TML 20109, TML 20212, TML 20215, TML 20512, TML 20515,
Power Line	shielded : length: 1.2m non-shielded

Note:

For more detailed features description, please refer to the manufacturer's specifications or User's Manual.

4.3. Deviation Record

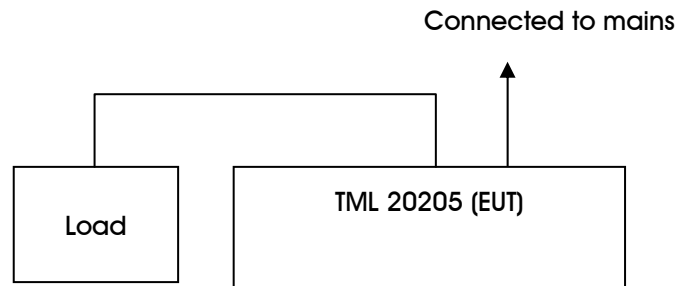
(If any deviation from additions to or exclusions from test method must be stated)

N/A

4.4. Table for Supporting Units

Support Unit	Brand	Model	Serial
YESO	N/A	FVR50W50OK	2K06

4.5. TEST SETUP



4.6. Performance Criteria Description

Criteria	Performance criteria
1.	Performance criterion A: The apparatus shall continue to operate as intended during and after the test. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer, when the apparatus is used as intended. The performance level may be replaced by a permissible loss of performance. If the minimum performance level or the permissible performance loss is not specified by the manufacturer, either of these may be derived from the product description and documentation, and from what the user may reasonably expect from the apparatus if used as intended.
2.	Performance criterion B: The apparatus shall continue to operate as intended after the test. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer, when the apparatus is used as intended. The performance level may be replaced by a permissible loss of performance. During the test, degradation of performance is however allowed. No change of actual operating state or stored data is allowed. If the minimum performance level or the permissible performance loss is not specified by the manufacturer, either of these may be derived from the product description and documentation, and from what the user may reasonably expect from the apparatus if used as intended.
3.	Performance criterion C: Temporary loss of function is allowed, provided the function is self-recoverable or can be restored by the operation of the controls.

5.2. Electromagnetic field

5.2.1. Test Condition

- Ambient Temperature: 25°C
- Relative Humidity: 60%

5.2.2. Test Requirement

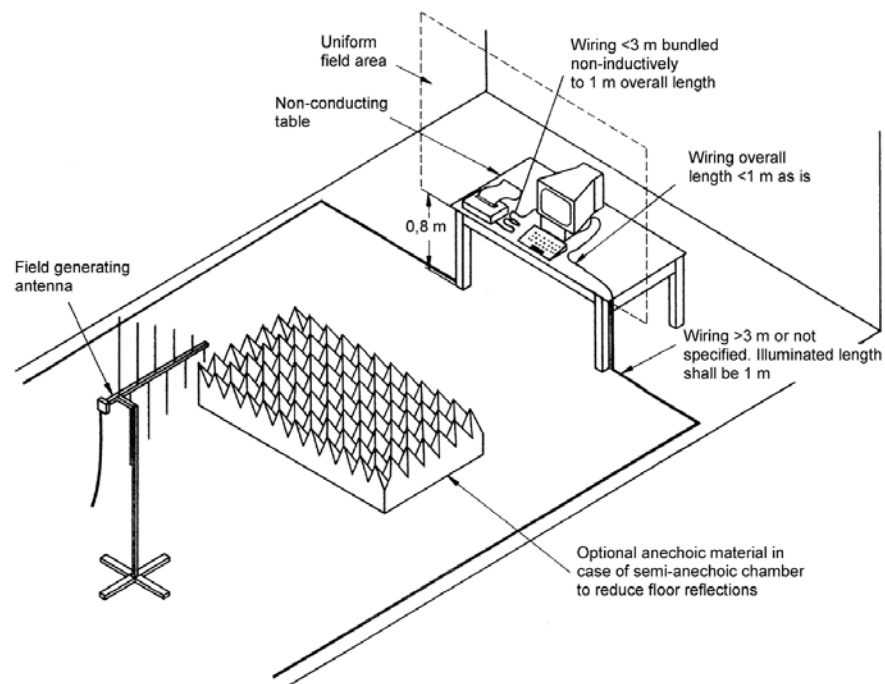
According to EN55024

☒ Frequency range: 80 to 1000 MHz, Field strength: 3 V/m prior to modulation

5.2.3. Test Procedures

According to IEC 61000-4-3 : 2006

5.2.4. Test Setup Layout



5.2.5. Test Result

PASS.

☒ Frequency range: 80 to 1000 MHz · Field strength: 3 V/m prior to modulation

5.3. Conducted radio frequency

5.3.1. Test Condition

- Ambient Temperature: 26°C
- Relative Humidity: 60%

5.3.2. Test Requirement

According to IEC EN55024

Frequency range: 0.15 to 80 MHz, Field strength: 3 V, 80% AM (1kHz)

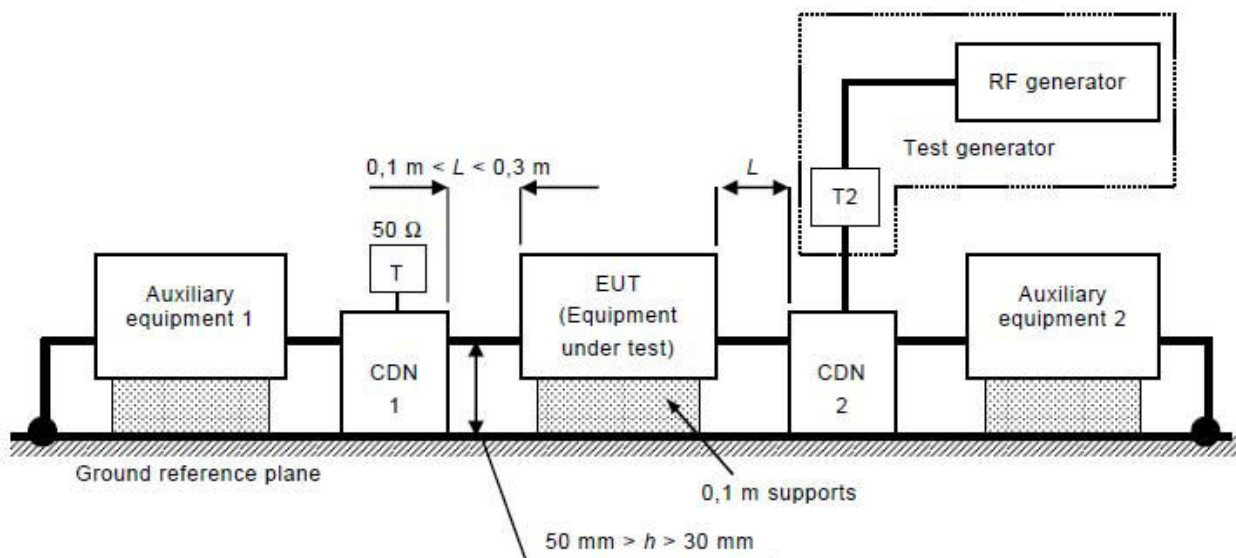
- ☒ Input power port.
☐ Signal and telecommunication ports

The measurement has to be done between each power line and ground at the power terminal.

5.3.3. Test Procedures.

According to IEC 61000-4-6 : 1996/A1 : 2001

5.3.4. Test Setup Layout



5.3.5. Test Result

EUT power: power port

Frequency range: 0.15 to 80 MHz, Field strength: 3 V, 80% AM (1kHz)

- ☒ Input power port
Performance criterion: ☒ A ☐ B ☐ C

☐ Signal and telecommunication ports.

Performance criterion: ☐ A ☐ B ☐ C

The EUT was placed on the test table with essential peripherals connected. The EUT was tested on the normal function.

5.4. Burst/fast transients

5.4.1. Test Condition

- Ambient Temperature: 24°C
- Relative Humidity: 62%

5.4.2. Test Requirement

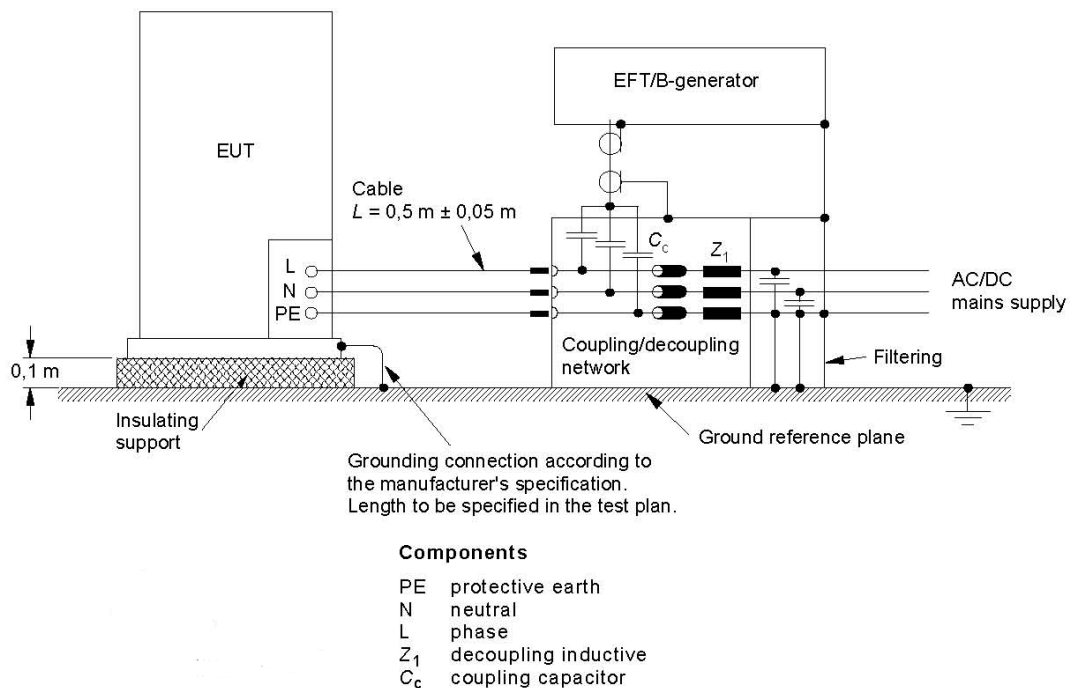
According to EN55024

- ☒ ± 1 kV input power ports
- ☐ ± 0.5 kV for Signal, telecommunication

5.4.3. Test Procedures

According to IEC 61000-4-4 : 2004

5.4.4. Test Setup Layout



5.4.5. Test Result

PASS.

EUT power: power port

☒ ± 1 kV input power ports: Line+ Line

Performance criterion: ☒ A ☐ B ☐ C

☐ ± 0.5 kV On I/O (input/output) signal, data and control ports: RJ45

Performance criterion: ☐ A ☐ B ☐ C

5.5. Surge/show transient

5.5.1. Test Condition

- Ambient Temperature: 25°C
- Relative Humidity: 61%

5.5.2. Test Requirement

According to EN55024

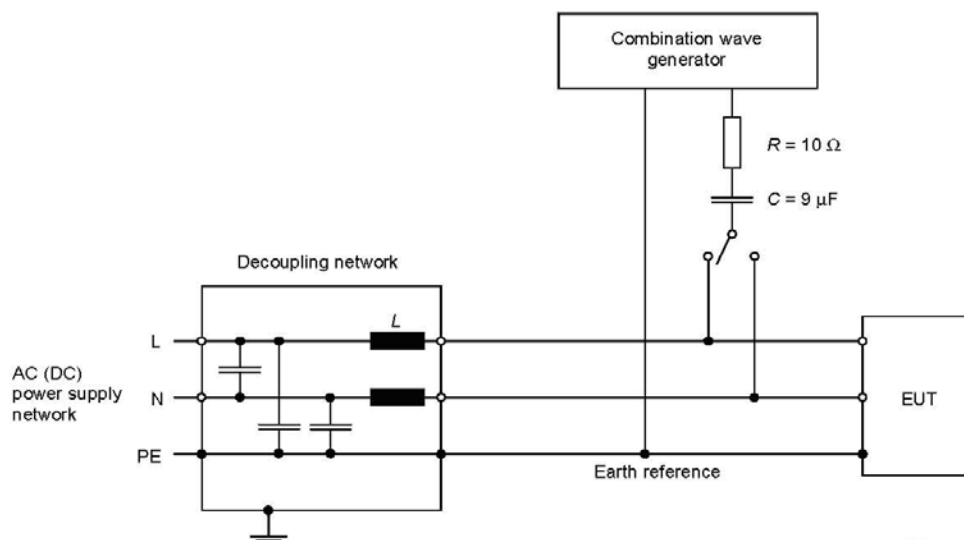
- ☒ Input power port : ☒ Line to Line: $\pm 1\text{ kV}$ (peak), 1.2/50 (8/20) Tr/Th us
☒ Line (Neutral) to earth: $\pm 2\text{ kV}$ (peak), 1.2/50 (8/20) Tr/Th us

The measurement has to be done between each power line and ground at the power terminal.

5.5.3. Test Procedures

According to IEC 61000-4-5 : 2006

5.5.4. Test Setup Layout



5.5.5. Test Result

PASS.

EUT power Port

☒ $\pm 1\text{ kV}$ (peak): Line to Line

Performance criterion: ☒ A ☐ B ☐ C

☒ Line (Neutral) to earth: $\pm 2\text{ kV}$ (peak), 1.2/50 (8/20) Tr/Th us

Performance criterion: ☒ A ☐ B ☐ C

5.6. Power Frequency Magnetic Field

5.6.1. Test Condition

- Ambient Temperature: 25°C
- Relative Humidity: 61%

5.6.2. Test Requirement

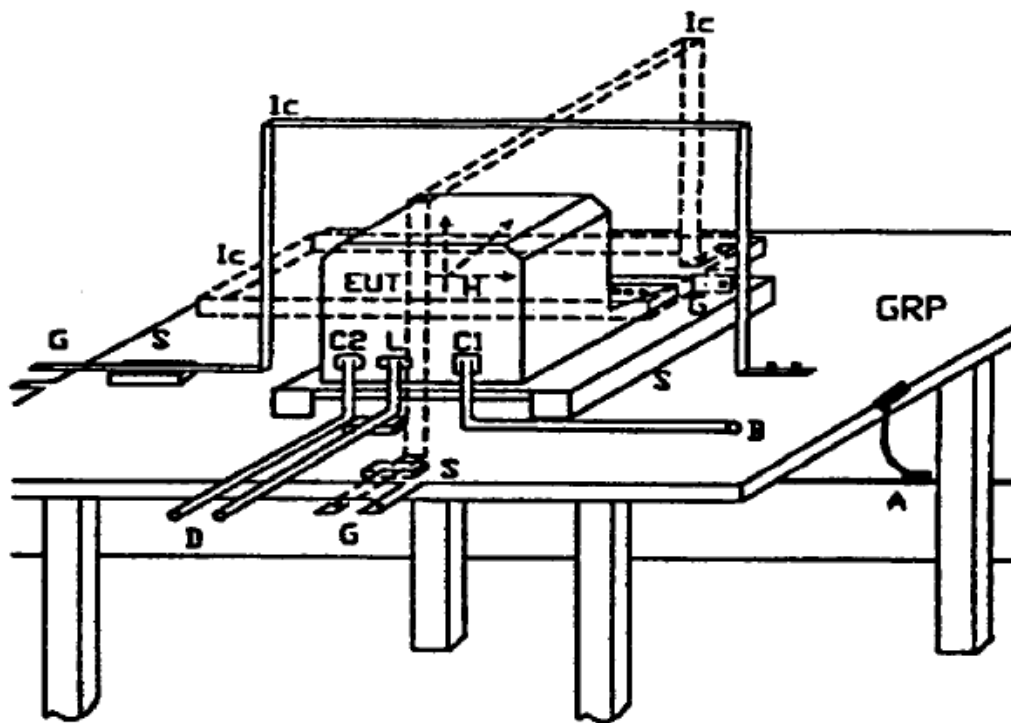
According to EN55024

- ☒ Power Frequency is 50Hz
- ☒ Magnetic field strength: 1A/m

5.6.3. Test Procedures

According to IEC 61000-4-8 : 1993/A1 : 2001

5.6.4. Test Setup Layout



5.6.5. Test Result

PASS.

EUT power Port

- ☒ Power Frequency is 50Hz

Performance criterion: ☒ A ☐ B ☐ C

- ☒ Magnetic field strength: 1A/m

Performance criterion: ☒ A ☐ B ☐ C

5.7. Power supply Interruptions / Power supply Dips

5.7.1. Test Condition

- Ambient Temperature: 25°C
- Relative Humidity: 61%

5.7.2. Test Requirement

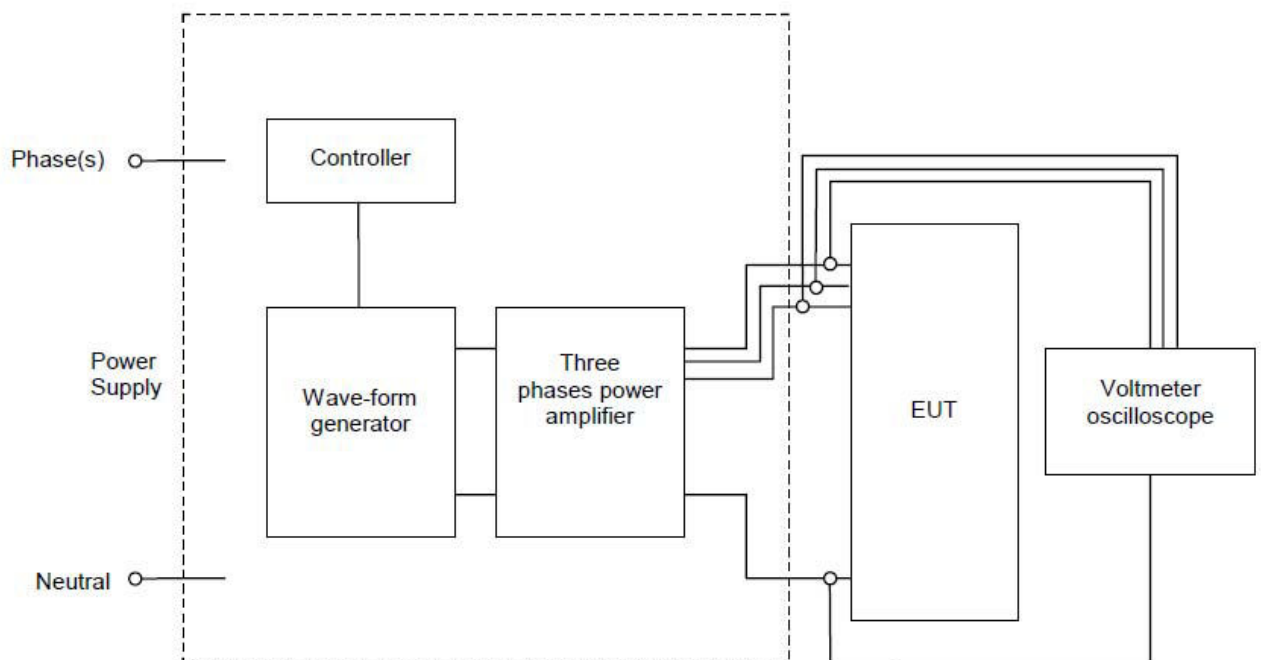
According to EN550204

- ☒ Voltage Interruptions 95% : Durations (ms) 500 ms
- ☒ Voltage dips 30 % : Durations (ms) 500 ms
- ☒ Voltage dips 95 % : Durations (ms) 10 ms

5.7.3. Test Procedures

According to IEC 61000-4-11 : 2004

5.7.4. Test Setup Layout



5.7.5. Test Result

PASS.

EUT power Port

- ☒ Voltage Interruptions 95% : Durations (ms) 500 ms

Performance criterion: ☐A ☐B ☒C

- ☒ Voltage dips 30% : Durations (ms) 500 ms

Performance criterion: ☐A ☐B ☒C

- ☒ Voltage dips 95 % : Durations (ms) 10 ms

Performance criterion: ☐A ☒B ☐C

6. EMISSION TESTS RESULT

6.1. Radiated emission

6.1.1. Test Condition

- Ambient Temperature: 25°C
- Relative Humidity: 62%

6.1.2. Test Requirement

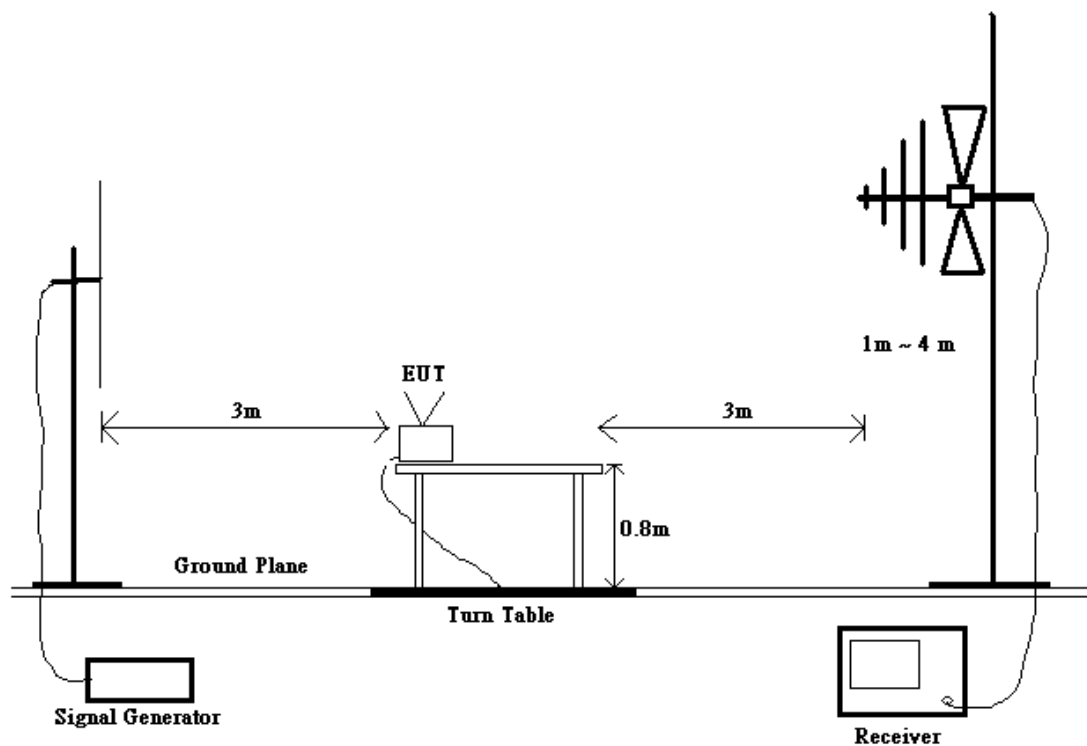
According to EN55022

Frequency (MHz)	Quasi-Peak dB(μ V/m)
30 ~230	30
230-1000	37

6.1.3. Test Procedures.

According to EN55022

6.1.4. Test Setup Layout



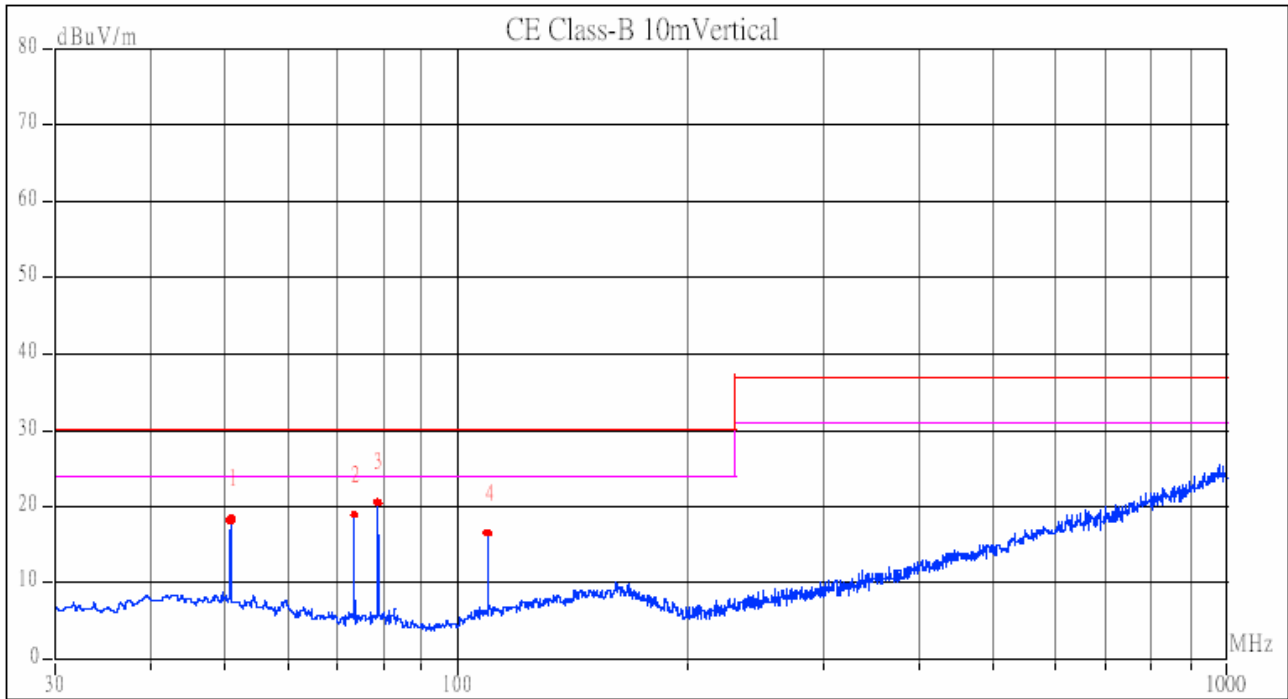
6.1.5. Test Result

PASS.

Notes

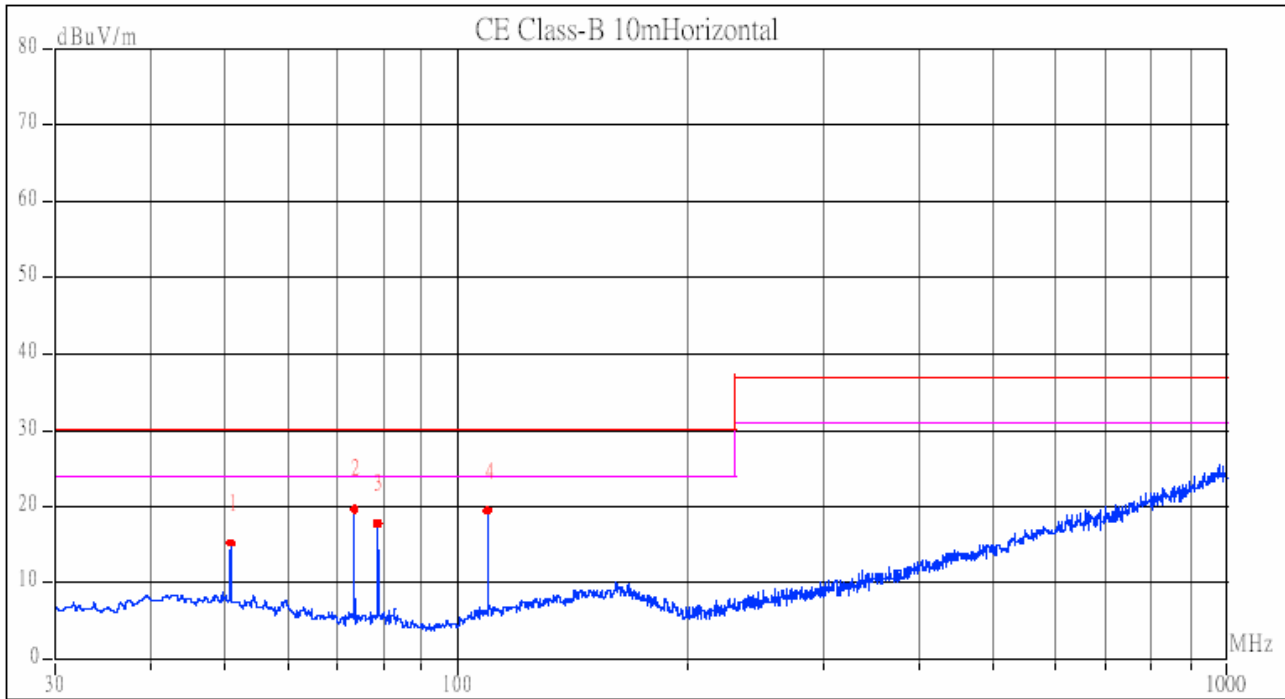
- 1) Measurement Distance: 10m
- 2) Height of table on which the EUT was placed: 0.8 m
- 3) Height of Receiving Antenna: 1 - 4 m
- 4) Example Calculation: result for 62.6442 MHz: $16.26 + (12.55) = 28.81 \text{ dB } \mu\text{V/m}$
- 5)(a) If the data table appeared symbol of "***" means the value was too low to be measured.
(b) If the data table appeared symbol of "#" means the noise was low, so record the peak value.
- 6) The estimated measurement uncertainty of the result measurement is
 - + 4.5dB / - 4.6dB ($30\text{MHz} \leq f \leq 300\text{MHz}$)
 - + 4.3dB / - 4.3dB ($300\text{MHz} \leq f \leq 1\text{GHz}$)

Full Load /Vertical



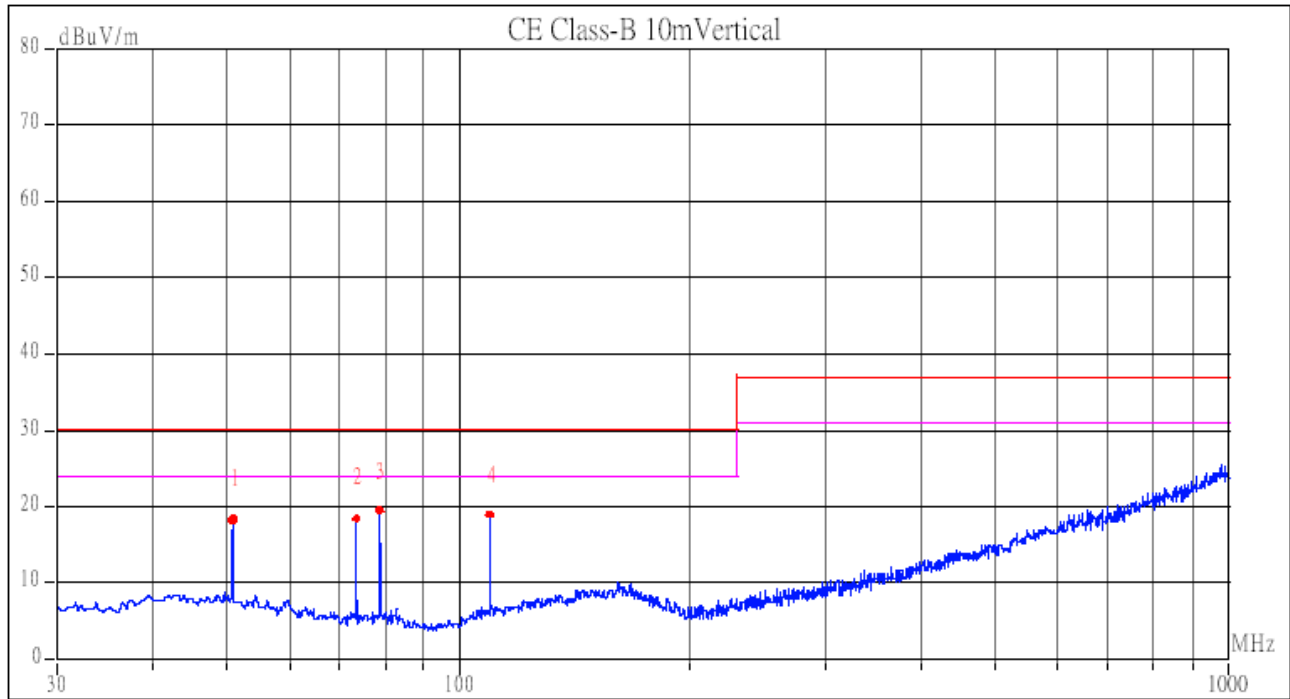
Frequency (MHz)	Reading Amplitude (dB μ V)	Table Degree (°)	Antenna Height (Meter)	Correction Factor (dB/m)	Emission Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)
50.6690	9.03	3.70	1.00	9.26	18.29	30.00	-11.71
73.5130	11.27	198.10	1.00	7.65	18.92	30.00	-11.08
78.9530	12.50	15.20	1.00	8.20	20.70	30.00	-9.30
109.8470	3.08	46.90	1.00	13.57	16.65	30.00	-13.35

Full Load /Horizontal



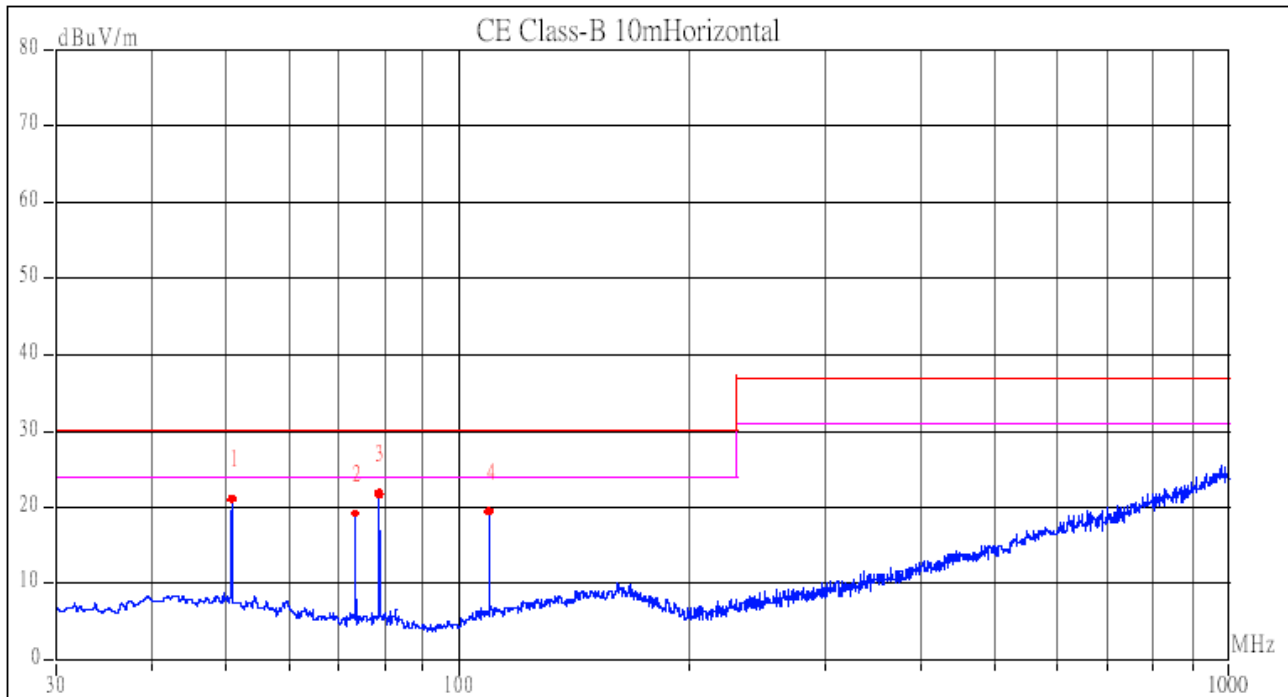
Frequency (MHz)	Reading Amplitude (dBμV)	Table Degree (°)	Antenna Height (Meter)	Correction Factor (dB/m)	Emission Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)
50.6690	5.92	234.00	1.00	9.26	15.18	30.00	-14.82
73.5130	11.99	237.90	1.00	7.65	19.64	30.00	-10.36
78.9530	9.72	260.20	1.00	8.20	17.92	30.00	-12.08
109.8470	5.98	94.50	1.00	13.57	19.55	30.00	-10.45

Half Load /Vertical



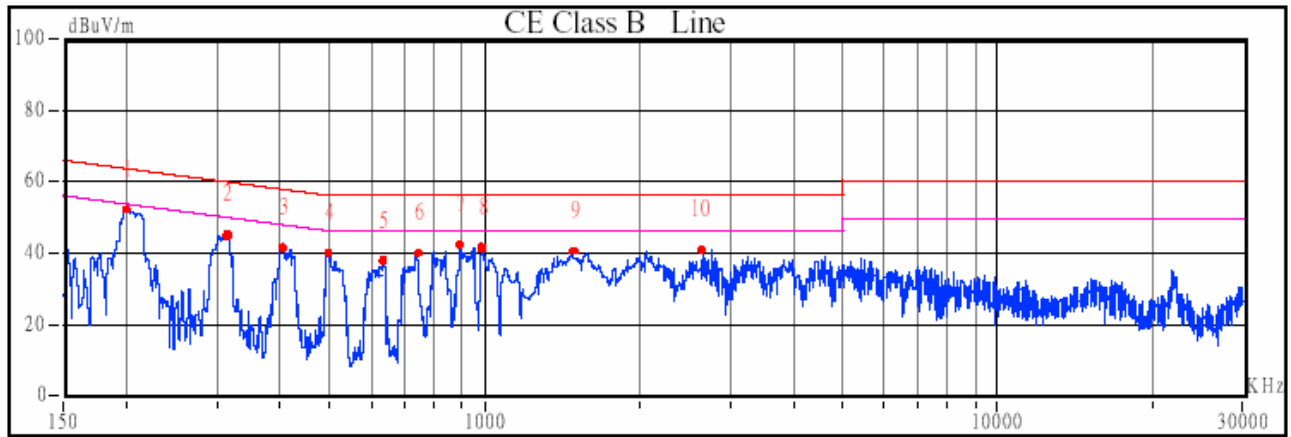
Frequency (MHz)	Reading Amplitude (dB μ V)	Table Degree (°)	Antenna Height (Meter)	Correction Factor (dB/m)	Emission Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)
50.6690	9.00	273.80	1.00	9.26	18.26	30.00	-11.74
73.5130	10.85	116.50	1.00	7.65	18.50	30.00	-11.50
78.9530	11.19	342.80	1.00	8.20	19.39	30.00	-10.61
109.8470	5.38	154.20	1.00	13.57	18.95	30.00	-11.05

Half Load /Horizontal

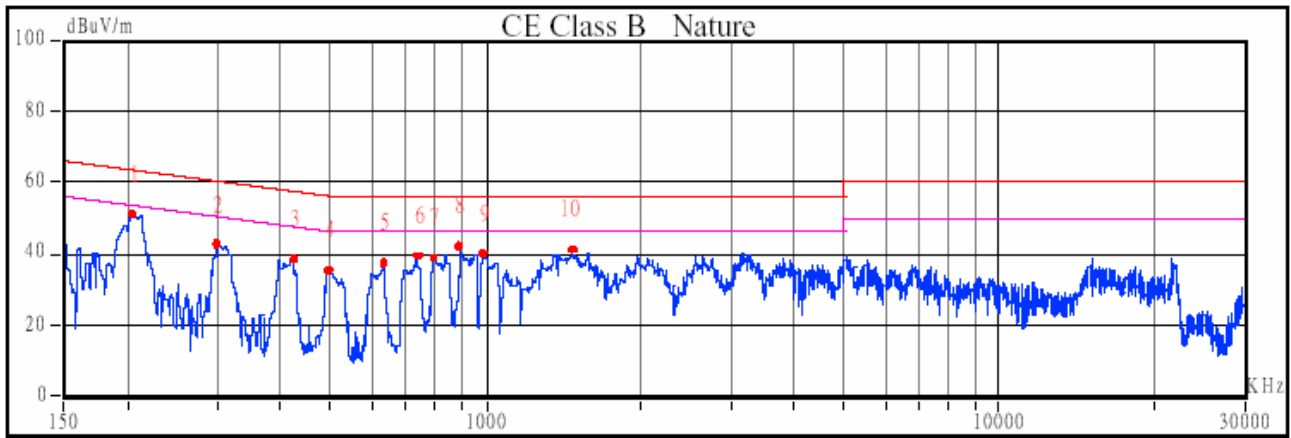


Frequency (MHz)	Reading Amplitude (dB μ V)	Table Degree (°)	Antenna Height (Meter)	Correction Factor (dB/m)	Emission Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)
50.6690	11.84	11.60	4.00	9.26	21.10	30.00	-8.90
73.5130	11.69	198.30	4.00	7.65	19.34	30.00	-10.66
78.9530	13.58	359.10	4.00	8.20	21.78	30.00	-8.22
109.8470	5.91	115.60	4.00	13.57	19.48	30.00	-10.52

Full Load

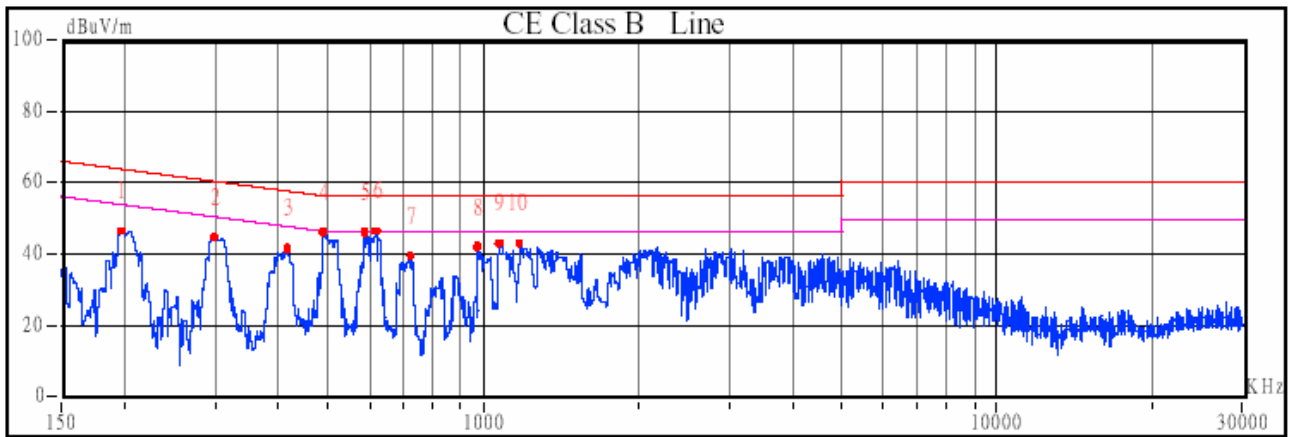


Frequency (KHz)	Emission Level (dBμV)			Limit (dBμV)		Margin (dB)	
	Peak	QP	Avg.	QP	Avg.	QP	Avg.
197.600	46.70	43.83	28.69	64.64	54.64	-20.81	-25.95
300.450	47.41	45.11	30.92	61.70	51.70	-16.59	-20.78
416.050	43.40	40.48	24.53	58.40	48.40	-17.92	-23.87
487.450	45.29	42.14	29.14	56.36	46.36	-14.22	-17.22
586.900	45.60	41.88	29.71	56.00	46.00	-14.12	-16.29
620.050	46.62	42.36	28.98	56.00	46.00	-13.64	-17.02
722.900	40.34	36.05	22.61	56.00	46.00	-19.95	-23.39
974.500	42.55	37.85	21.55	56.00	46.00	-18.15	-24.45
1075.000	43.45	38.40	23.68	56.00	46.00	-17.60	-22.32
1175.000	44.37	39.25	24.71	56.00	46.00	-16.75	-21.29

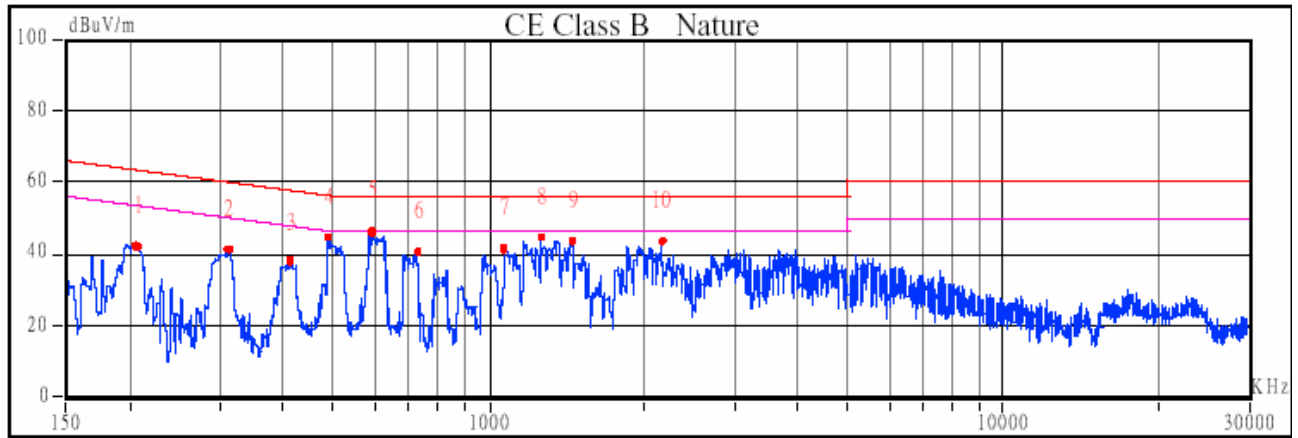


Frequency (KHz)	Emission Level (dBμV)			Limit (dBμV)		Margin (dB)	
	Peak	QP	Avg.	QP	Avg.	QP	Avg.
204.400	48.28	46.91	45.54	64.45	54.45	-17.54	-8.91
299.600	42.49	39.85	32.90	61.73	51.73	-21.88	-18.83
422.850	37.82	34.36	25.87	58.20	48.20	-23.84	-22.33
495.950	34.15	32.16	22.26	56.12	46.12	-23.96	-23.86
633.650	33.76	31.62	21.92	56.00	46.00	-24.38	-24.08
739.900	36.79	35.58	22.11	56.00	46.00	-20.42	-23.89
793.450	37.28	35.72	21.60	56.00	46.00	-20.28	-24.40
887.800	39.55	38.38	23.20	56.00	46.00	-17.62	-22.80
990.650	39.78	36.69	23.63	56.00	46.00	-19.31	-22.37
1475.000	41.44	39.76	25.53	56.00	46.00	-16.24	-20.47

Half Load



Frequency (KHz)	Emission Level (dB μ V)			Limit (dB μ V)		Margin (dB)	
	Peak	QP	Avg.	QP	Avg.	QP	Avg.
199.300	49.10	47.93	33.33	64.59	54.59	-16.66	-21.26
315.750	45.69	43.51	30.33	61.26	51.26	-17.75	-20.93
401.600	42.00	39.51	25.05	58.81	48.81	-19.30	-23.76
494.250	37.39	33.93	20.49	56.16	46.16	-22.23	-25.67
631.950	36.62	32.61	18.13	56.00	46.00	-23.39	-27.87
738.200	40.40	38.09	20.63	56.00	46.00	-17.91	-25.37
892.900	42.46	39.04	24.30	56.00	46.00	-16.96	-21.70
986.400	41.90	37.99	23.54	56.00	46.00	-18.01	-22.46
1485.000	40.84	37.62	24.72	56.00	46.00	-18.38	-21.28
2655.000	41.37	36.35	23.32	56.00	46.00	-19.65	-22.68



Frequency (KHz)	Emission Level (dB μ V)			Limit (dB μ V)		Margin (dB)	
	Peak	QP	Avg.	QP	Avg.	QP	Avg.
206.950	43.14	38.21	31.67	64.37	54.37	-26.16	-22.70
312.350	43.42	39.51	32.99	61.36	51.36	-21.85	-18.37
412.650	39.62	36.48	23.50	58.50	48.50	-22.02	-25.00
487.450	43.08	40.03	28.88	56.36	46.36	-16.33	-17.48
591.150	43.87	40.03	28.96	56.00	46.00	-15.97	-17.04
727.150	40.38	36.57	19.03	56.00	46.00	-19.43	-26.97
1075.000	40.47	35.72	23.11	56.00	46.00	-20.28	-22.89
1265.000	43.44	38.24	23.25	56.00	46.00	-17.76	-22.75
1450.000	44.26	39.58	21.45	56.00	46.00	-16.42	-24.55
2175.000	44.73	39.36	25.65	56.00	46.00	-16.64	-20.35

6.3. Harmonics Current Emissions Test

6.3.1. Test Condition

- Ambient Temperature: 25°C
- Relative Humidity: 62%

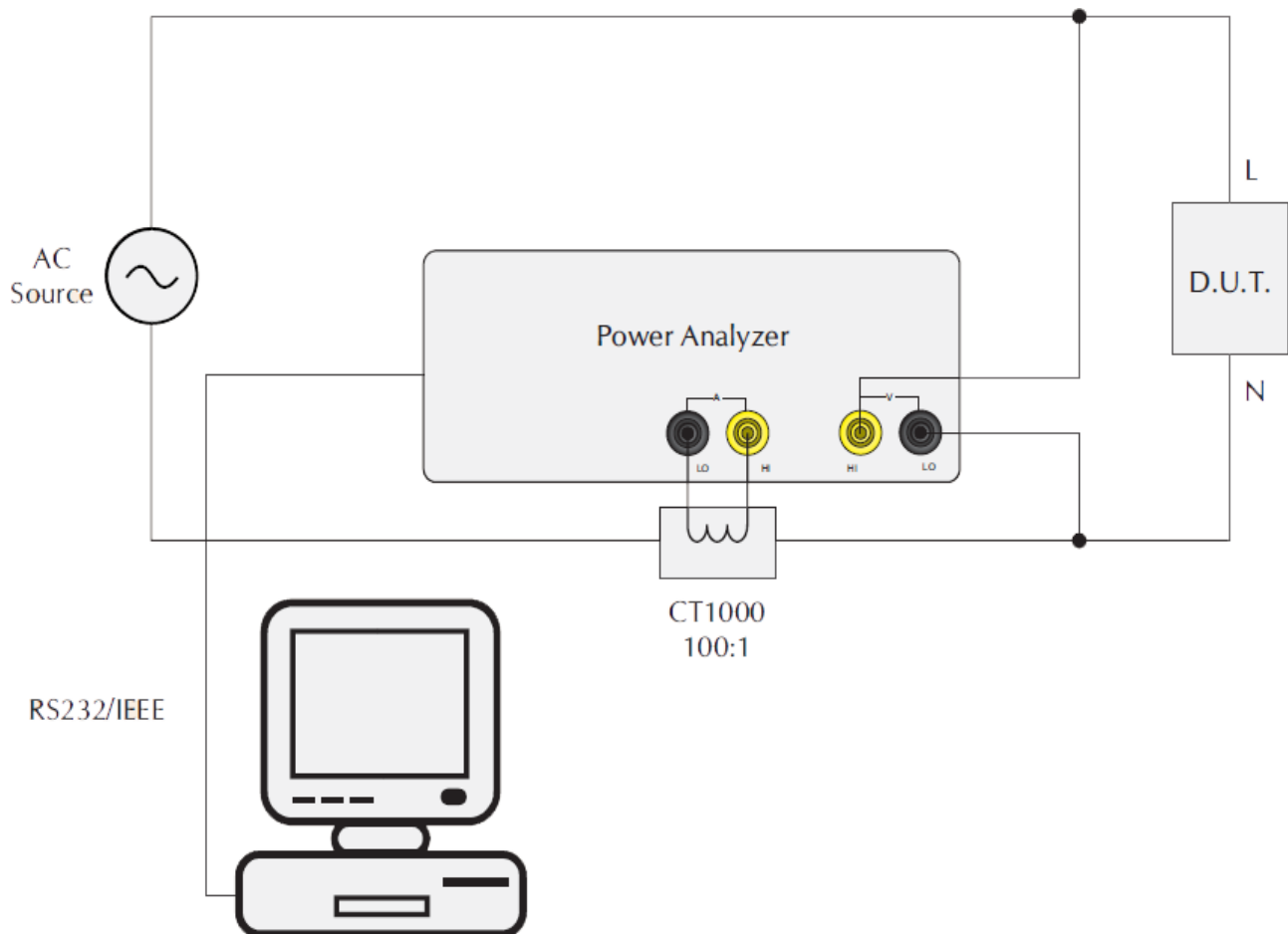
6.3.2. Test Requirement

According to IEC 61000-3-2

6.3.3. Test Procedures

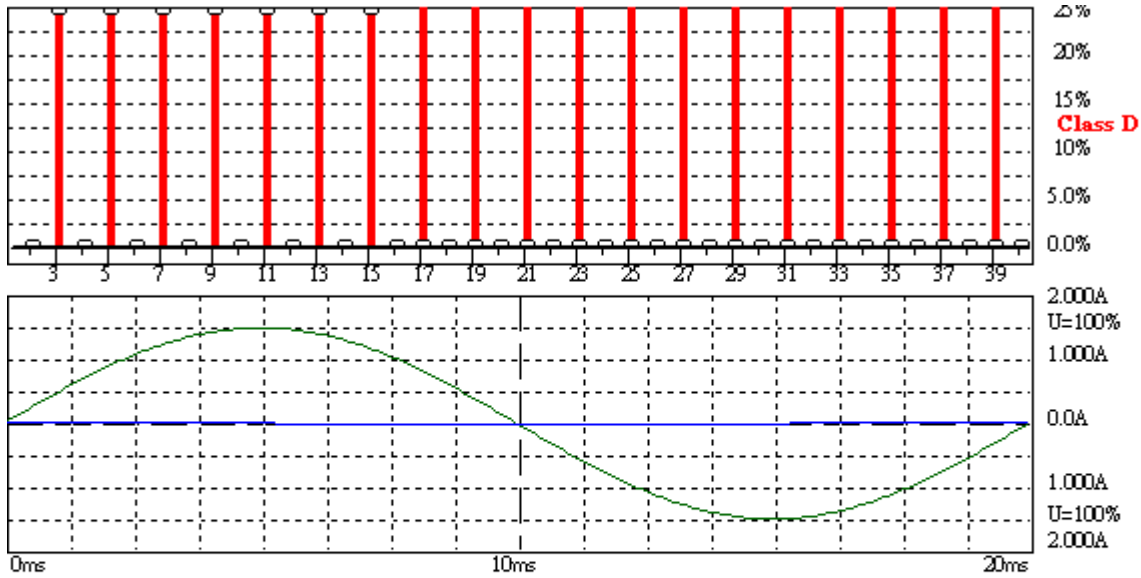
According to IEC 61000-3-2

6.3.4. Test Setup Layout



6.3.5. Test Result

PASS.



Harmonic Emission - IEC 61000-3-2, EN 61000-3-2, (EN60555-2)

2010/12/13 下午 06:1

U _{rms} =	230.5	V	P =	2.307	W	THC =	0.042	A	Range:	2 A
I _{rms} =	0.063	A	pf =	0.160		P _{max} =	2.350	W	V-nom:	230 V
									TestTime:	10 min (100%)

Please key in

Test completed, Result: PASSED

HAR-1000 EMC-Printer

6.4. Voltage Fluctuations and Flicker Test

6.4.1. Test Condition

- Ambient Temperature: 25°C
- Relative Humidity: 62%

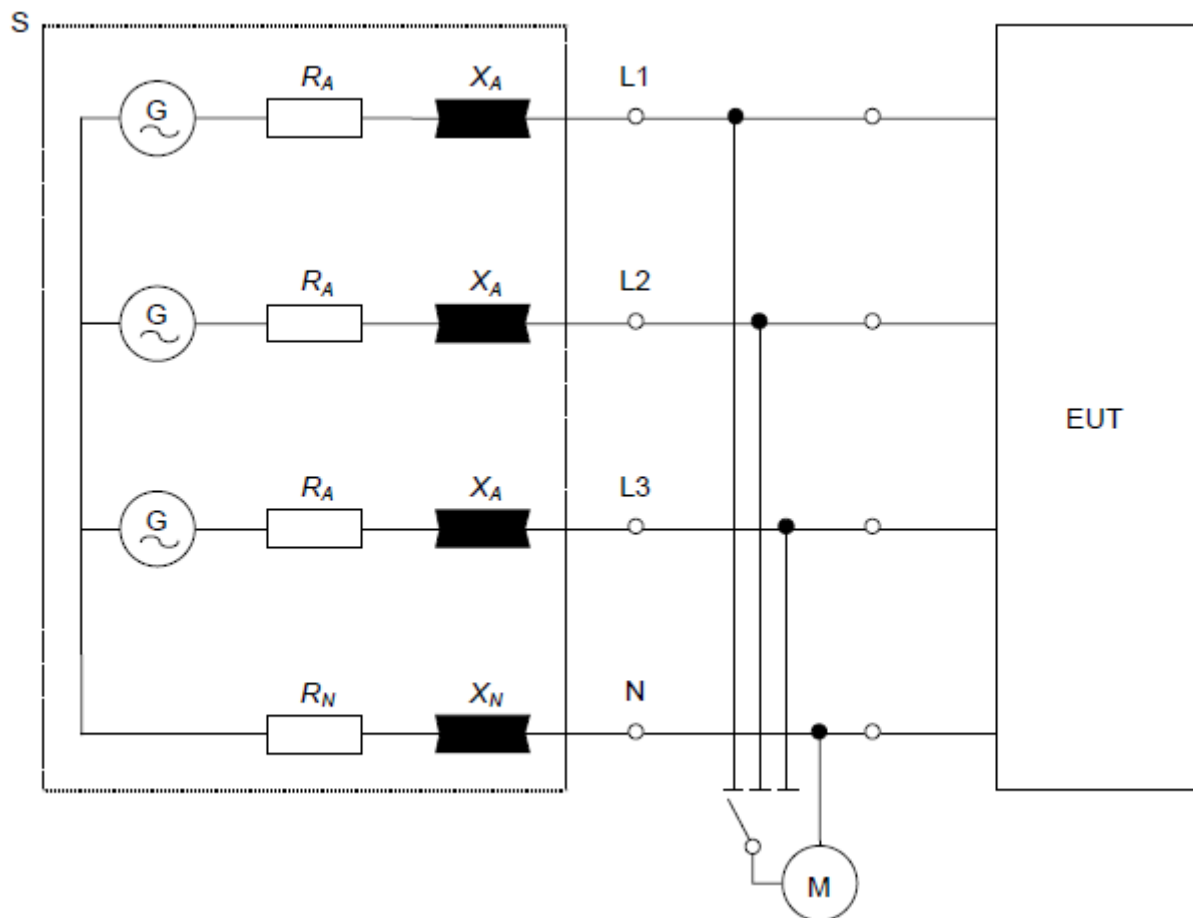
6.4.2. Test Requirement

According to IEC 61000-3-3

6.4.3. Test Procedures

According to IEC 61000-3-3

6.4.4. Test Setup Layout



EUT : equipment under test

M : measuring equipment

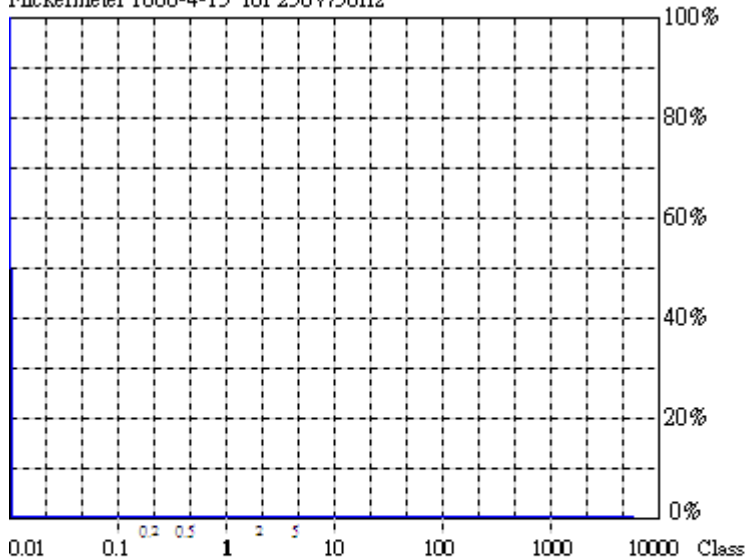
G : voltage source in accordance with 6.3 of IEC 61000-3-3.

S : supply source consisting of the supply voltage generator G and test impedance Z with the following elements which include the generator impedance:

6.4.5. Test Result

PASS.

Flickermeter 1000-4-15 for 230V/50Hz

**Actual Flicker (Fli): 0.00****Short-term Flicker (Pst): 0.07**

Limit (Pst): 1.00

Long-term Flicker (Plt): 0.07

Limit (Plt): 0.65

**Maximum Relative
Volt. Change (dmax): 0.07%**

Limit (dmax): 4.00%

**Relative Steady-state
Voltage Change (dc): 0.25%**

Limit (dc): 3.30%

**Maximum Interval
exceeding 3.30% (dt): 0.00ms**

Limit (dt>Lim): 500ms

Flicker Emission - IEC 61000-3-3 , EN 61000-3-3 , (EN60555-3)

2010/12/16 下午 10:5

Urms = 224.8 V P = OFL W

Range: 1 A

Irms = OFL A pf = —

V-nom: 230 V

TestTime: 120min (10000%)

*Please key in***Test completed, Result: PASSED***on view*

HAR-1000 EMC-Printer

7. PHOTOGRAPHS OF TEST CONFIGURATION

7.1. Radiated Emissions



7.2. Conducted Emissions



7.3. Harmonics Current Emissions Test Setup Photos



7.4. Voltage Fluctuations and Flicker Test Setup Photos



7.5. Electrostatic Discharge Immunity Test Setup Photo



7.6. RF Radiated Fields Immunity Test Setup Photo



7.7. EFT/Burst Immunity Test Setup Photo



7.8. Surge Immunity Test Setup Photo



7.9. RF Common Mode Immunity Test Setup Photo



7.10. Power Frequency Magnetic Field



7.11.Voltage Interruptions and Voltage Dips Immunity Test Setup Photo



8. PHOTOGRAPHS OF EUT

Outside view 1 of EUT



Outside view 2 of EUT

Inside view 3 of EUT

Inside view 4 of EUT

9. TEST EQUIPMENT AND ANCILLARIES USED FOR TESTS

No.	Instrument	Manufacture	Model	Serial No.	Last Calibrate
1	LISN (EUT)	Rolf Heine	NNB-2/16Z	99085	Jan. 09, 2008
2	LISN (AXE)	Rolf Heine	NNB-2/16Z	99086	Dec. 31, 2007
3	EMI Receiver	Rohde & Schwarz	ESI 7	830154/001	Dec. 17, 2007
4	50W Terminator	Amphenol	46650-51	N/A	May 11, 2008
5	RF Cable	Miyazaki	BNCP-50FB	N/A	Apr. 10, 2008
6	Coxial Cable	TIM MICROWAVE	LMR-400	N/A	Apr. 10, 2008
7	H/F Test System	EMC Partner	Harmonic-1000	080	May 02, 2008
8	ESD Emulator	Noiseken	ESS-100L(A)	0199C02380	Jul. 17, 2007
9	Signal Generator	HP	8648C	3623A03457	Feb. 18, 2008
10	Amplifier	IFI	CMX50	D019-0200	Apr. 19, 2008
11	Field Monitor	Amplifier Research	FM 2000	20391	Mar. 14, 2008
12	EMC Test System	EMC Partner	Transient-1000	TRA1000-341	Jul. 20, 2007
13	Absorbing Clamp	EMC Partner	Transient-1000	CNEFT1000-176	Jul. 20, 2007
14	E CLAMP	SCHAFFNER	KEMZ801	17044	Dec. 06, 2007
15	CDN	FRANKONIA	M2 + M3	A3011020	Dec. 06, 2007
16	Conducted Immunity Test System	FRANKONIA	CIT-10/75	102C3116	Dec. 06, 2007
17	Magnetic Coil	EMC Partner	MF-1000-1	MF1000-51	Sep. 07, 2007